

# Mineral Industry Surveys

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**For information, contact:**

Jozef Plachy, Zinc Commodity Specialist  
U.S. Geological Survey  
989 National Center  
Reston, VA 20192  
Telephone: (703) 648-4982, Fax: (703) 648-7757  
E-mail: [jplachy@usgs.gov](mailto:jplachy@usgs.gov)

Samir Hakim (Data)  
Telephone: (703) 648-4998  
Fax: (703) 648-7975  
E-mail: [shakim@usgs.gov](mailto:shakim@usgs.gov)

**Internet:** <http://minerals.usgs.gov/minerals>

## ZINC IN JULY 2003

Domestic mine production in July, at 67,000 metric tons (t), was about 1% higher in June, but was about 3% lower than in July 2002. Smelter production, at 22,100 t, was about 9% less than in June, but it was about 16% more than a year before. Apparent consumption, at 85,400 t, was about 3% more than during the previous month and about 10% more than in July 2002.

The Platts Metals Week average monthly composite price for North American Special High Grade zinc increased by more than 4% to 40.54 cents per pound in July. Compared with July 2002, the zinc price increased by about 3%.

Some industry experts believe that zinc prices will continue to inch upward. According to Kumba Resources Ltd. of South Africa, zinc prices should experience a moderate recovery this year, due to a combination of lower output, stronger demand, and declining exports from China. (Chinese exports of refined zinc between January and July declined by more than 15% compared with the same period in 2002.) Boliden Ltd. of Canada also expects an increase in demand (CRU International Ltd., 2003a).

According to CRU International Ltd., the zinc market in North America is suffering from low, albeit stable, demand and no sign of any supply shortage. Not only has Teck Cominco Ltd. maintained production at its Trail, British Columbia, smelter, the company also has begun selling zinc metal produced by CalEnergy Minerals LLC in California. CalEnergy is reported to be producing 8 t of high grade zinc per day with a capacity of 30,000 metric tons per year (t/yr). The company also may begin production of special high-grade zinc in the last half of 2003 (CRU International Ltd., 2003b).

Teck Cominco Ltd. announced the successful development of a new, low-cost process for the extraction of zinc metal from sulfide ores. The process uses naturally occurring bacteria to leach ore heaps. A test of the process from October 2000 until December 2002 yielded about 1 metric ton per day of electrolytic zinc. The process, which does not require grinding and flotation of the ore, produces zinc with a total direct operating cost of 20 cents per pound. In addition, the process is applicable to a variety of zinc ores and is environmentally

beneficial and free of sulfur dioxide emissions (Teck Cominco Ltd., 2003§<sup>1</sup>).

The management of Peru's Compañía Minera Volcán has been authorized to begin formal negotiations with Glencore International AG of Switzerland in its pursuit of a partnership or sale of its assets. Reportedly, Glencore is to acquire 20% interest in Volcán. Bids made by three other companies (Companhia Paraibuna de Metais, Brazil; Minsur S.A. and BHL Resources Limited Inc., Peru) have not been disclosed (CRU International Ltd., 2003c).

Pasminco Ltd. of Australia decided to close the Cockle Creek smelter near Newcastle, New South Wales, in September 2003 rather than between 2006 and 2008 as was previously announced. Reasons for advancing the closure include lower treatment charges, the strengthening value of the Australian dollar, higher than expected expenditure requirements for meeting future environmental standards, and increasing difficulties in meeting production targets while operating an aging plant. The closure is not expected to affect the Elura Mine sale negotiations, because the smelter is expected to close before the mine is exhausted (Pasminco Ltd., 2003§).

The Australian Bureau of Agriculture and Resources Economics (ABARE) estimated that world zinc production in 2003 will amount to 9.6 million metric tons (Mt), slightly less than in 2002, but increase to 9.8 Mt in 2004. World demand for zinc is to increase by about 4% to 9.47 Mt in 2003 and rise further to 9.85 Mt in 2004. China, accounting for 19% of global demand for zinc, is expected to contribute a significant portion of world demand growth (Metal-Pages, 2003b§).

### Environment

The International Lead Zinc Research Organization Inc. reported the completion of a multi-year collaborative research effort to advance and assess certain soil remediation methodologies through the International Program for the Remediation and Inactivation of Metals in Situ (IPRIMIS).

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<sup>1</sup>References that include a section twist (§) are found in the Internet References Cited section.

IPRIMIS involved four international laboratories in Australia, Belgium, United Kingdom, and the United States. Soil samples from 14 different mines were collected and treated by remediation materials, such as biosolids, cyclonic ashes, kaolin amorphous derivatives, lime, phosphorus, red gypsum, red mud, and water treatment residuals. The objective was to assess the ability of various treatments to reduce the bioavailability of lead and zinc to ecosystems and humans; determine the physical, chemical, and biological basis for reductions in bioavailability and solubility; to standardize test methods; and to encourage an exchange of information on these activities among the laboratories. In all but one laboratory, the most successful remediation material was phosphorus or a combination of phosphorus and biosolids, which also enriched the soil for plant and microbial growth (ILZRO Environmental Update, 2003).

### Update

The second attempt to sell Horsehead Industries Inc. apparently reached an impasse. An earlier offer by Sun Capital Partners Inc. had been withdrawn on July 2, and an offer by North American Zinc Corp. (NAZC) (a subsidiary of U.S. Zinc Corp.) was filed on July 30. According to NAZC, unilateral changes inconsistent with the agreement were inserted into proposed bankruptcy court orders that were not approved by, or acceptable to, NAZC. The purchase may still take place because Horsehead is still willing to continue discussions with NAZC, and NAZC used the qualifier “at this point” when announcing its rejection of the altered agreement (Metal Bulletin, 2003).

Pasminco Ltd. of Australia has agreed to sell its Gordonsville and Clinch Valley zinc mines and related facilities in Tennessee to Tennessee Valley Resources. Pasminco will retain ownership of the Clarksville, TN, zinc plant, which is reported to be among the most efficient mid-size zinc processing plants in the world. When the sale is completed, Tennessee Valley will take ownership of the Gordonsville operations, while the Clinch Valley Mine will remain in Pasminco’s possession until the remaining ore is mined out, at about mid 2004 (Metal-Pages, 2003c§).

The acquisition of the Elura Mine by Consolidated Broken Hill Ltd. (CBH) is proceeding according to schedule and should be completed before October. At that time CBH will pay \$1.5 million to Pasminco, post an environmental bond of \$3.1 million, and pay out a \$4.5 million lease agreement on the Newcastle ship loading equipment. The cost of acquiring and upgrading the mine will be borne by CBH alone, because Clough Engineering Ltd. elected not to exercise its option to commit equity to the Elura project and will no longer be the project’s mining contractor. CBH and Clough had signed a letter of understanding to form a 50:50 joint venture to operate the mine. CBH is to issue \$4.33 million in shares to Clough in

payment for Clough’s work on the project (Mining Journal, 2003). CBH plans to begin upgrading the Elura Mine soon after its purchase, scheduled for September 12. The \$6.2 million improvement program is designed to increase output from 1.2 million metric tons per year (Mt/yr) to 1.4 Mt/yr, improve efficiency, and double mine life to at least 9 years. Toho Zinc Co. Ltd. of Japan agreed to invest \$4.9 million in shares and agreed to purchase all the concentrate exported from Elura (Platts Metals Week, 2003).

Boliden Metals AB of Sweden agreed to acquire the zinc and copper operations of Finland’s Outokumpu Oy. In exchange, Boliden will pay about \$400 million in cash and will relinquish 49% interest in the new company to Outokumpu. Outokumpu received an exemption from Swedish regulations that require companies to bid for the entire company when their shareholding exceeds 40%. Outokumpu’s zinc assets include the Kokkola smelter in Finland with a capacity of 260,000 t/yr; the 150,000-t/yr capacity Oda smelter in Norway; and the Tara zinc mine in Ireland, which produces about 150,000 t/yr of zinc in concentrate. When the agreement is signed, Boliden will become the world’s fourth largest zinc mining and smelting company, employing about 4,800 people. Smelting activities will contribute about 80% of revenues with the remainder derived from mining operations (Metal-Pages, 2003a§).

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TABLE 1  
SALIENT ZINC STATISTICS<sup>1</sup>

(Metric tons, unless otherwise specified)

	2002	2003			
	January- December	May	June	July	January- July
<b>Production:</b>					
Mine, zinc content of concentrate	780,000 <sup>†</sup>	67,800	66,500 <sup>†</sup>	67,000	453,000
Mine, recoverable zinc	754,000	65,200	64,000	64,500	436,000
Smelter, refined zinc	259,000	22,400	24,200	22,100	161,000
<b>Consumption:</b>					
Refined zinc, reported	421,000	34,700	38,200 <sup>†</sup>	34,100	243,000
Ores <sup>°</sup> (zinc content)	727	61	61	61	424
Zinc-base scrap <sup>°</sup> (zinc content)	189,000	15,900	15,900	15,900	111,000
Copper-base scrap <sup>°</sup> (zinc content)	176,000	14,700	14,700	14,700	103,000
Aluminum-and magnesium-base scrap <sup>°</sup> (zinc content)	1,430	120	120	120	837
Total <sup>°</sup>	789,000	65,500	68,900 <sup>†</sup>	64,800	458,000
Apparent consumption, metal <sup>2</sup>	1,150,000	80,600	83,000	85,400	615,000 <sup>3</sup>
Stocks of refined (slab) zinc, end of period:					
Producer <sup>4</sup>	XX	7,300	7,770	8,360	XX
Consumer <sup>5</sup>	XX	55,700	55,600	56,100	XX
Merchant	XX	9,990	9,990	9,990	XX
Total	XX	72,900	73,300	74,400	XX
Shipments of zinc metal from Government stockpile	5,040	997	--	3,530	5,240
<b>Imports for consumption:</b>					
Refined (slab) zinc	874,000	59,200	61,000	NA	378,000 <sup>6</sup>
Oxide (gross weight)	69,700	8,400	7,540	NA	44,300 <sup>6</sup>
Ore and concentrate (zinc content)	122,000	19,700	20,200	NA	65,900 <sup>6</sup>
<b>Exports:</b>					
Refined (slab) zinc	1,160	52	134	NA	653 <sup>6</sup>
Oxide (gross weight)	10,800	848	960	NA	5,790 <sup>6</sup>
Ore and concentrate (zinc content)	822,000	20,700	11,500	NA	128,000 <sup>6</sup>
Waste and scrap (gross weight)	47,700	3,640	3,890	NA	21,900 <sup>6</sup>
<b>Price:</b>					
London Metal Exchange, average, dollars per metric ton	\$778.38	\$775.33	\$790.31	\$827.19	\$786.22
Platts Metals Week North American Special High Grade, average, cents per pound	38.64	38.18	38.87	40.54	38.73

<sup>°</sup>Estimated. <sup>†</sup>Revised. NA Not available. XX Not applicable. -- Zero.

<sup>1</sup>Data are rounded to no more than three significant digits; except prices; may not add to totals shown.

<sup>2</sup>Smelter production plus imports minus exports plus shipments from Government stockpile plus stock change.

<sup>3</sup>Data based on reported consumption, stocks, and estimated trade data.

<sup>4</sup>Data from U.S. Geological Survey and American Bureau of Metal Statistics.

<sup>5</sup>Includes an estimate for companies that report annually.

<sup>6</sup>Includes data through June only.

TABLE 2  
REFINED ZINC PRODUCED IN THE UNITED STATES<sup>1</sup>

(Metric tons)

Month	Beginning stocks <sup>2</sup>	Production	Shipments	Ending stocks <sup>2</sup>
2002:				
July	6,670	19,100	18,900	6,830
August	6,830	16,200	16,000	7,010
September	7,010	17,900	17,400	7,470
October	7,470	16,100	16,600	7,020
November	7,020	21,800	20,800	7,970
December	7,970	23,500	22,900	8,550
Year	XX	259,000	257,000	XX
2003:				
January	8,550	24,900	21,500	11,900
February	11,900	22,800	25,800	8,930
March	8,930	21,700	24,500	6,110
April	6,110	23,000	20,700	8,340
May	8,340	22,400	23,500	7,300
June	7,300	24,200	23,700	7,770
July	7,770	22,100	21,500	8,360
January-July	XX	161,000	161,000	XX

XX Not applicable.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>Includes stocks held at locations other than smelters.

Sources: U.S. Geological Survey and American Bureau of Metal Statistics.

TABLE 3  
APPARENT CONSUMPTION OF REFINED ZINC ACCORDING TO INDUSTRY USE AND PRODUCT<sup>1</sup>

(Metric tons)

Industry and product	2002	2003			
	January- December	May	June	July <sup>2</sup>	January- July
Galvanizing:					
Sheet and strip	477,000	34,500	35,400 <sup>r</sup>	36,100	261,000
Other	175,000	11,000	10,500 <sup>r</sup>	12,000	87,100
Total	652,000	45,500	46,000 <sup>r</sup>	48,200	348,000
Brass and bronze	189,000	13,200 <sup>r</sup>	13,600 <sup>r</sup>	12,300	98,100
Zinc-base alloy	233,000	17,300	17,000 <sup>r</sup>	18,300	131,000
Other uses <sup>3</sup>	71,700	4,600	6,500	6,800	37,800
Grand total	1,150,000	80,600	83,000	85,400	615,000

<sup>r</sup>Revised

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>Data based on reported consumption, stocks and estimated trade data.

<sup>3</sup>Includes zinc used in making zinc dust, desilvering lead, powder, alloys, anodes, chemicals, castings, light metal alloys, rolled zinc, and miscellaneous uses not elsewhere specified.

TABLE 4  
AVERAGE MONTHLY ZINC PRICES<sup>1</sup>

Period	North American	LME cash	
	¢/lb.	¢/lb.	\$/t
2002:			
July	39.30	36.04	794.45
August	37.27	33.89	747.24
September	37.81	34.29	755.88
October	37.71	34.21	754.30
November	38.09	34.70	764.91
December	39.69	36.17	797.36
Year	38.64	35.31	778.38
2003:			
January	38.72	35.43	781.01
February	38.68	35.60	784.80
March	38.88	35.86	790.60
April	37.23	34.21	754.30
May	38.18	35.17	775.33
June	38.87	35.85	790.31
July	40.54	37.52	827.19
January-July	38.73	35.66	786.22

<sup>1</sup>Special High Grade.

Source: Platts Metals Week.

TABLE 5  
U.S. EXPORTS OF ZINC<sup>1</sup>

Material	2002		2003 <sup>2</sup>			
	Quantity (metric tons)	Value (thousands)	June		Year to date	
			Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
Refined (slab) zinc	1,160	\$1,210	134	\$199	653	\$675
Ore and concentrate (zinc content)	822,000	322,000	11,500	3,380	128,000	35,200
Waste and scrap (gross weight)	47,700	23,000	3,890	2,440	21,900	12,100
Powders, flakes, dust (zinc content)	5,660	8,120	431	624	3,280	4,180
Oxide (gross weight)	10,800	14,600	960	1,460	5,790	7,450
Chloride (gross weight)	1,950	1,930	222	207	695	733
Sulfate (gross weight)	2,900	1,760	128	107	1,350	810
Compounds, other (gross weight)	217	600	31	47	75	247

<sup>1</sup>Data are rounded to no more than three significant digits.

<sup>2</sup>Data for July 2003 were not available at time of publication.

Source: U.S. Census Bureau.

TABLE 6  
U.S. IMPORTS FOR CONSUMPTION OF ZINC<sup>1</sup>

Material	2002		2003 <sup>2</sup>			
	Quantity (metric tons)	Value (thousands)	June		Year to date	
			Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
Refined (slab) zinc	874,000	\$716,000	61,000	\$51,300	378,000	\$310,000
Ore and concentrate (zinc content)	122,000	44,600	20,200	5,180	65,900	19,500
Waste and scrap (gross weight)	31,200	9,530	809	498	5,160	2,720
Powders, flakes, dust (zinc content)	30,900	47,800	2,030	3,010	14,200	21,400
Oxide (gross weight)	69,700	57,600	7,540	5,380	44,300	33,300
Chloride (gross weight)	716	775	24	37	313	355
Sulfate (gross weight)	20,100	10,300	1,330	718	14,200	6,640
Compounds, other (gross weight)	1,030	1,180	135	173	354	403

<sup>1</sup>Data are rounded to no more than three significant digits.

<sup>2</sup>Data for July 2003 were not available at time of publication.

Source: U.S. Census Bureau.

TABLE 7  
SHIPMENTS OF ZINC METAL FROM THE NATIONAL DEFENSE  
STOCKPILE<sup>1</sup>

(Metric tons)

Period	Beginning inventory	Shipments	Ending inventory
2002:			
July	111,000	890	110,000
August	110,000	445	110,000
September	110,000	--	110,000
October	110,000	1,130	109,000
November	109,000	--	109,000
December	109,000	--	109,000
Year	XX	5,040	XX
2003:			
January	109,000	516	108,000
February	108,000	--	108,000
March	108,000	--	108,000
April	108,000	200	108,000
May	108,000	997	107,000
June	107,000	--	107,000
July	107,000	3,530	104,000
January-July	XX	5,240	XX

XX Not applicable. -- Zero.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

Source: Defense Logistics Agency.

TABLE 8  
U.S. IMPORTS OF ZINC, BY TYPE OF MATERIAL AND COUNTRY<sup>1,2</sup>

(Metric tons)

Material and country	General imports			Imports for consumption		
	2002	2003		2002	2003	
		June	Year to date		June	Year to date
Ore and concentrate (zinc content):						
Australia	41,800	20,200	20,200	41,800	20,200	20,200
Ireland	6,570	--	18,000	6,570	--	18,000
Mexico	12,700	--	--	12,700	--	--
Peru	61,100	--	27,700	61,100	--	27,700
Other	118	--	--	118	--	--
Total	122,000	20,200	65,900	122,000	20,200	65,900
Blocks, pigs, or slab:						
Australia	35,000	--	14,000	21,000	--	14,000
Brazil	30,200	1,330	12,200	30,200	1,330	8,060
Canada	523,000	40,500	257,000	523,000	40,500	257,000
China	39,700	--	21,900	1,040	--	22
Japan	10,500	--	--	--	--	--
Kazakhstan	93,200	6,240	12,000	93,200	6,240	12,000
Korea, Republic of	76,200	--	19,000	2,480	17	17
Mexico	136,000	10,800	63,300	136,000	10,800	63,300
Peru	36,000	2,090	22,100	34,300	2,090	21,800
Poland	9,340	--	1,600	9,340	--	1,600
Russia	10,700	--	--	10,700	--	--
Other	25,200	--	--	13,100	--	--
Total	1,020,000	61,000	423,000	874,000	61,000	378,000
Dross, ashes, fume (zinc content)	15,500	1,180	7,180	15,500	1,180	7,180
Grand total	1,160,000	82,300	496,000	1,010,000	82,400	451,000
Oxide (gross weight):						
Canada	44,800	3,920	24,100	44,800	3,920	24,100
China	838	--	302	838	--	302
Japan	869	130	555	869	130	555
Mexico	19,900	3,020	16,700	19,900	3,020	16,700
Netherlands	2,640	435	2,430	2,640	435	2,430
Other	760	41	181	760	41	181
Total	69,700	7,540	44,300	69,700	7,540	44,300
Other (gross weight):						
Waste and scrap	31,200	809	5,160	31,200	809	5,160
Sheets	1,640	103	945	1,640	103	945
Powders, flakes, dust (zinc content)	30,900	2,030	14,200	30,900	2,030	14,200

-- Zero.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>Data for July 2003 were not available at time of publication.

Source: U.S. Census Bureau.